

Summary WD/iNS Working Group IACHEC #12, Lake Arrowhead, USA

2017-02-29

Attendees:

Kristin Madsen

Jeremy Drake

Nick Durham

Brian Grefenstette

Vinay Kashyap

Craig Markwardt

Shu Koyama

Hiromitsu Takahashi

Kenya Oshimizu

Yukikatsu Terada

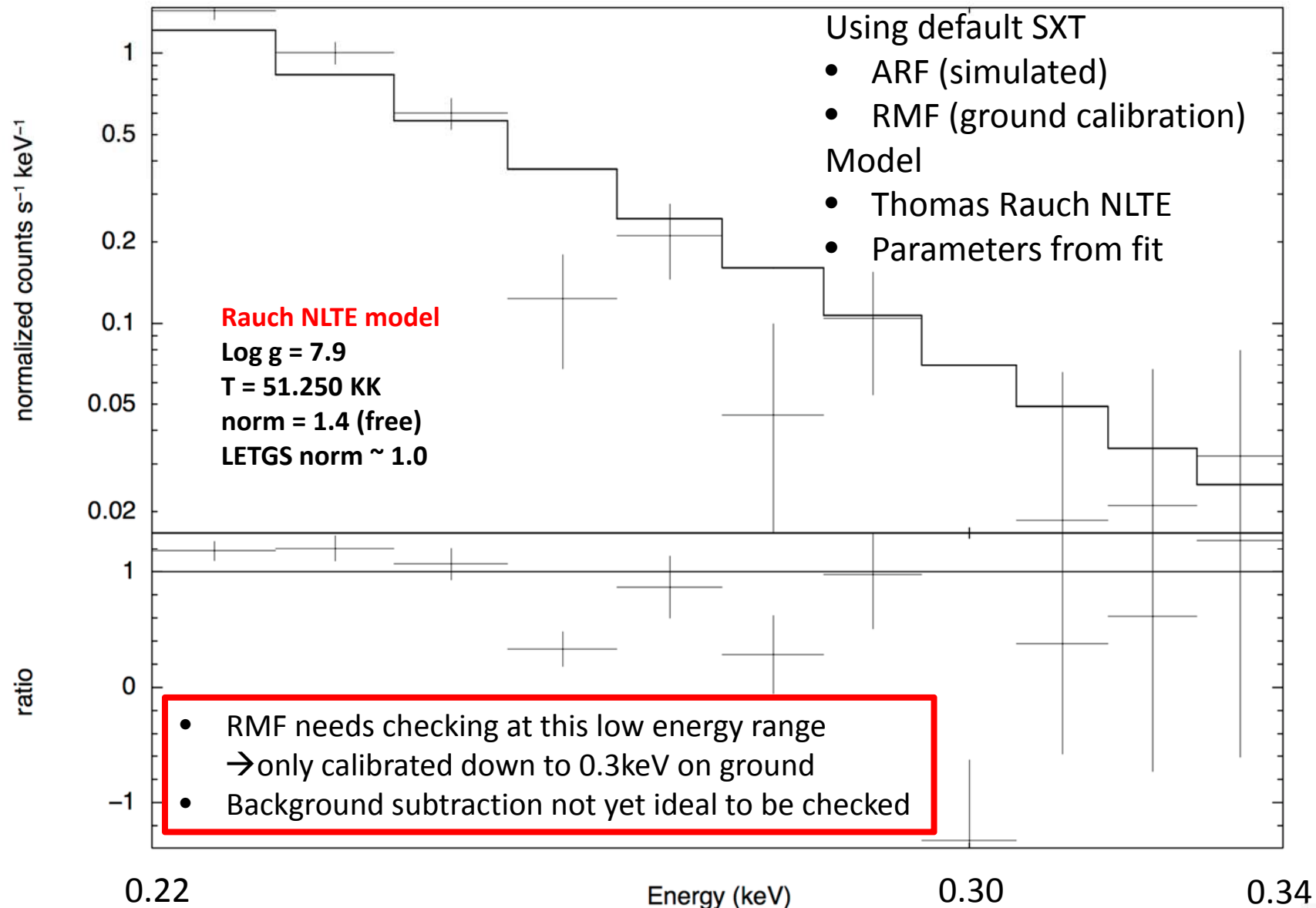
Vadim Burwitz

WD Observations with ASTROSAT

- HZ43A (HZ43BM3.5 star 13mag, check if flaring)
 - SXT (observed, check high energy cut-off)
 - UVIT (check if observable)



HZ43A ASTROSAT SXT 14ksec Detail

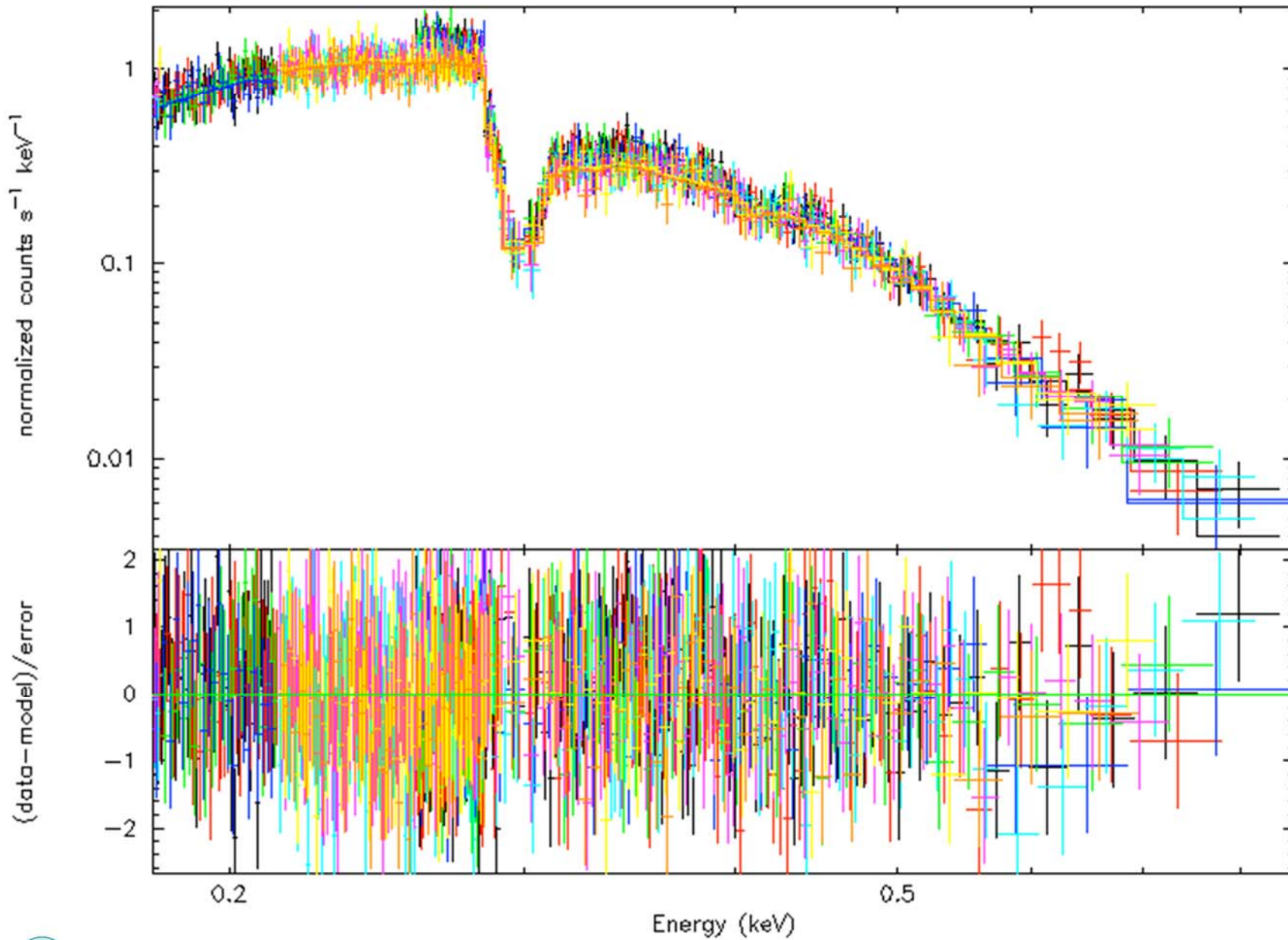


iNS Observations with ASTROSAT

- RXJ1856 (ask KP)
 - SXT (not observed yet important for low E calibration)
 - UVIT (optically very faint: 26 mag in HAST)
- RXJ0720 (ask KP)
 - SXT (58ksec) has been observed
 - UVIT (??)
- Models
 - Blackbody (well constrained from existing missions)
 - Sufficient for calibrating response shape
 - Relative calibration
 - Physical models
 - Different approaches : strongly magnetized atmospheres
→ same shape as bb model



data and folded model



RXJ1856 Fit Results

- Model TBabs<1>*bbodyrad<2>** Source No.: 1 Active/On
#Model Model Component Parameter Unit Value
par comp
1 1 TBabs nH 10^22 7.24535E-03 +/- 3.43494E-04
2 2 bbodyrad kT keV 6.23787E-02 +/- 3.79046E-04
3 2 bbodyrad norm 1.58155E+05 +/- 6513.96

Using energies from responses.

#Fit statistic : Chi-Squared = 693.13 using 1254 PHA bins.

#Test statistic : Chi-Squared = 693.13 using 1254 PHA bins.
Reduced chi-squared = 0.55406 for 1251 degrees of freedom
Null hypothesis probability = 1.000000e+00
Weighting method: standard

!XSPEC12> error 1 2 3
Parameter Confidence Range (2.706)
1 0.00668153 0.00781739 (-0.000563825,0.000572039)
2 0.0617595 0.063001 (-0.000619178,0.000622327)
3 147885 169271 (-10270.4,11116.1)
#

RXJ1856 and NICER

Peak Effective Area

- At 0.5 keV 1000 cm²
- at 1.5 keV 1900cm²

Model (VB)

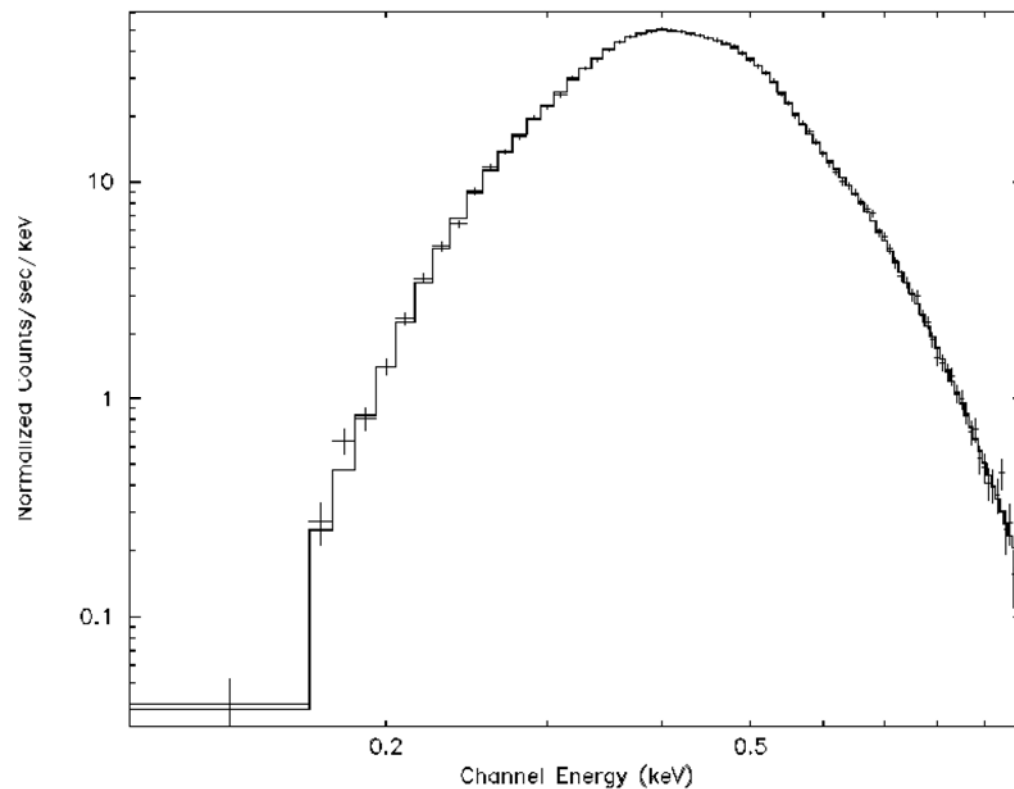
- Model predicted countrate
 - 13cts/s 0.1 -1.0 keV all detectors (FPMs)
 - 0.24 cts/s per FPM



RXJ1856 and NICER

Model (VB) predicted countrate

→ 13cts/s 0.1 -1.0 keV all detectors (FPMs)
0.24 cts/s per FPM



RX J1856 High Energy Excess >1keV

Astro-PH 1703.05995v1

- **Discovery of a keV-X-ray Excess in RX J1856.5–3754**
- Tomokage YONEYAMA^{1,2}, Kiyoshi HAYASHIDA^{1,2}, Hiroshi NAKAJIMA^{1,2}, Shota INOUE^{1,2} and Hiroshi TSUNEMI^{1,2}

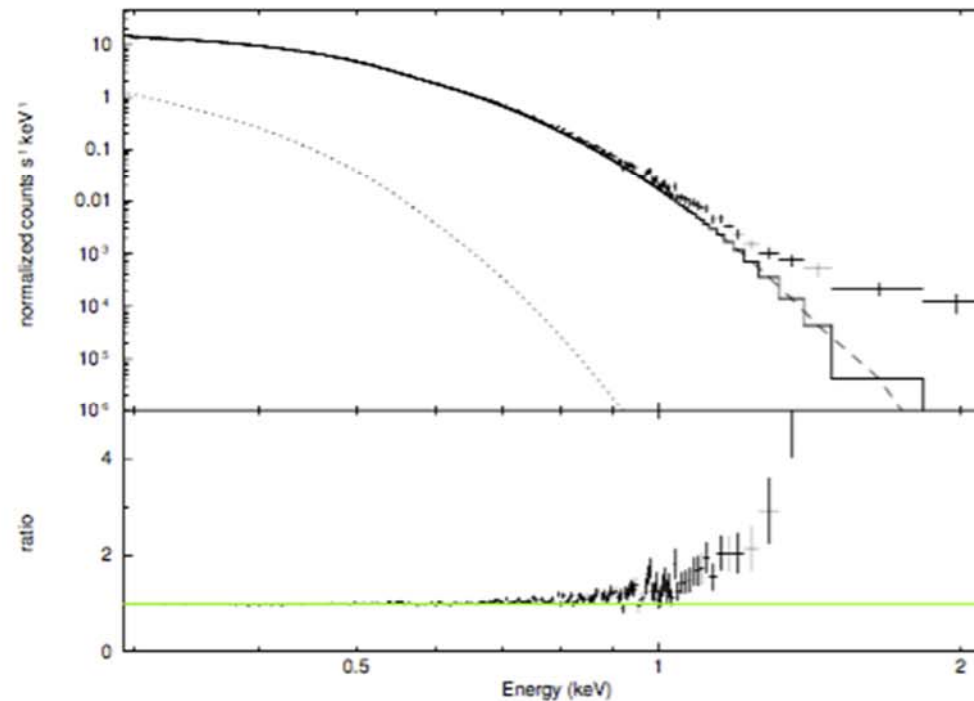


Fig. 4. Merged spectrum of the EPIC-pn data listed in table 2, obtained in twelve observations during 2004–2015 with the 2T blackbody model which gives $\chi_r^2 = 3.06$ for 147 dof. Similarly the keV-excess is apparent.



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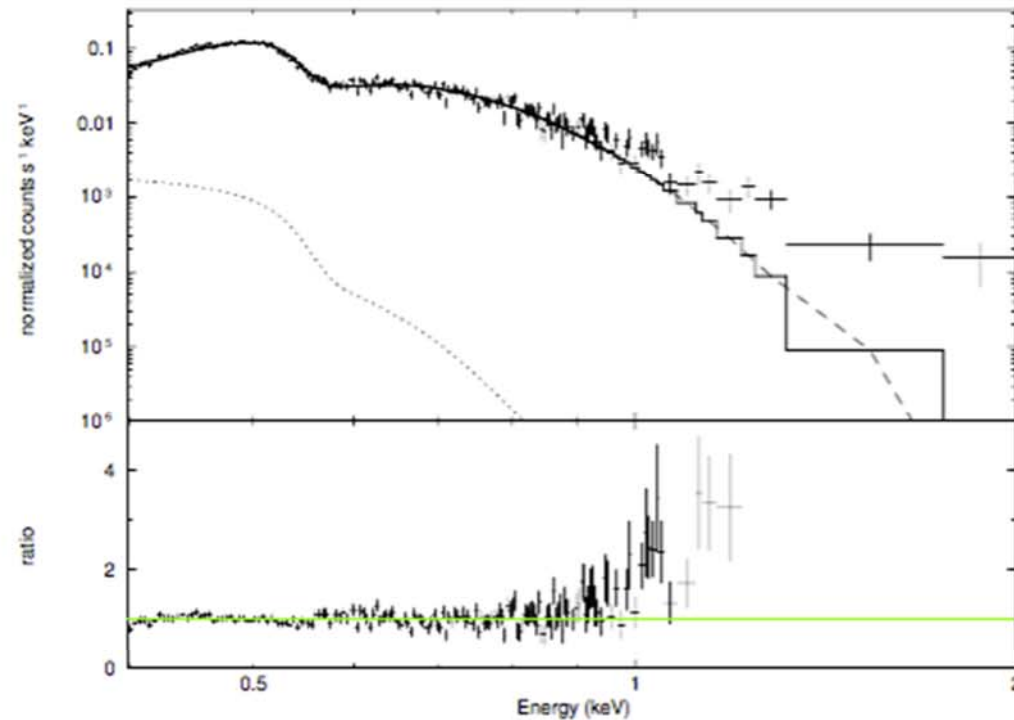


Fig. 3. Spectra of XIS FI CCDs with the contamination-corrected 2T blackbody model. The fit provides $\chi_r^2 = 1.40$ for 187 dof, but the keV-excess is visible in > 0.8 keV energy range.



RXJ1856 and NuSTAR

- Simulation with powerlaw model
→ predicts $2e-5$ cts/sec in 3 – 10 keV band
- Unlikely to be detected in a reasonable exposure time <150 ks

Parameters defined:

```
=====
Model powerlaw<1> Source No.: 1 Active/On
Model Model Component Parameter Unit Value
par comp
  1 1 powerlaw PhoIndex 3.36000 +/- 0.0
  2 1 powerlaw norm 5.20000E-06 +/- 0.0
=====
```



WG Actions

- Provide KP with Rauch models for fitting ASAP (March 2016), as tables for XSPEC ✓
→ see 1st fit to ASTROSAT HZ43A data on subsequent pages
- SXT definitely requires RXJ1856 observation → to help improve the low energy response observation not scheduled yet due to bright source constraints for UVIT (if GALEX has observed field it should be OK) **Status to be checked**
- **What is the current status of the SXT observations- A. Beardmore and SXT team**
- iNS provide blackbody model parameters from Drake and Burwitz + IACHEC 2017 efforts
- Add Models and LETGS spectra to IACHEC wiki (2017)
- Check HZ43A and HZ43B co-added spectra for high energy tail in HRC-S + LETG (Vinay, Jeremy)
→ **no sign of HZ43B is seen in the recent Chandra LETG data** ✓
- HITOMI → **get info from Contamination group**

